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XII.

INJURIOUS INSECTS AND OTHER ANIMALS OBSERVED IN IRELAND DURING THE YEARS 1914 AND 1915.

By GEORGE H. CARPENTER, M.SC., F.E.S.; Professor of Zoology in the Royal College of Science for Ireland, and Consulting Entomologist to the Royal Dublin Society.

(Plates XIV–XVII.)

[Read June 20; Published September 29, 1916.]

CABBAGE AND TURNIP INSECTS.

The Diamond-back Moth.

Plutella maculipennis Curtis (*cruciferarum* Zell.).

The summer of 1914 was noteworthy for the great abundance of this insect in many parts of Ireland as well as in Great Britain. During the month of July specimens of the caterpillar were received from the Cos. of Antrim, Donegal, Tyrone, Galway, Wexford, and Dublin. It occurred, doubtless, in many other Irish counties, and the damage to the leaves of cruciferous crops, especially of white turnips and swedes, was, in many cases, great. A description of the insect, with figures, was given in an early paper of this series (1, pp. 144–7), and a good account of its life-history, and of what can be done to check its ravages, may be found in Leaflet No. 21, issued by the English Board of Agriculture. The tendency of the Diamond-back Moth to be unusually numerous and very destructive in certain years is well known. From the reports of the late Miss Ormerod (6) and subsequent observations, the "Diamond-back years" in the British Isles may be reckoned as 1883, 1889, 1891, 1894, 1897, 1901.

The Turnip Moth.

Agrotis segetum (Linn.).

Caterpillars of this common insect were noticed as very destructive, both to cabbage and turnip, in the King's and Queen's Counties in late July and early August, eating the plants just below the surface of the ground, as is their usual custom.

The Cabbage Fly.

Phorbia brassicae (Bouché).

This exceedingly common pest is abundant every year. In June, 1914, the maggots were found in a Co. Dublin garden feeding on radishes.

CORN INSECTS.

The Oat Aphid.

Aphis avenae Fab.

Oat plants covered with "greenfly" were received from Co. Kerry at the end of July, 1915. A few of the insects were referable to *Macrosiphum granaria* Buckton, but the vast majority had the short, comparatively stout cornicles that characterize *Aphis avenae* Fab. This species, as pointed out by Theobald (9, pp. 65–7), is identical with the Migratory Apple Aphid known as *A. Fitchii* Sanderson, which has been lately described and figured in this series of papers (2, pp. 147–9). The winged males and wingless females are found in late autumn on apple trees, where they lay their eggs from which come the "stem mothers" of the succeeding spring. The first few generations of virgin females live on the apple until winged insects migrate to various grasses, including cereals. Thus one and the same species is directly harmful, alternately in the cornfield and in the orchard.

POTATO INSECTS.

The Potato Aphid.

Rhopalosiphum solani Theobald.

(Plate XV E.)

In March, 1914, potato-tubers that were being "sprouted" in boxes were received from Co. Antrim, with large numbers of this aphid feeding on the developing shoots. The species is probably of frequent occurrence on potato foliage. From such presence of the spring virgin females on the shoots in the sprouting-boxes, it may be inferred that the autumn females had laid their fertilized eggs on the tubers. This is the view taken by Theobald (10,

pp. 70–2), who has observed a similar infestation of sprouting potatoes in Kent.

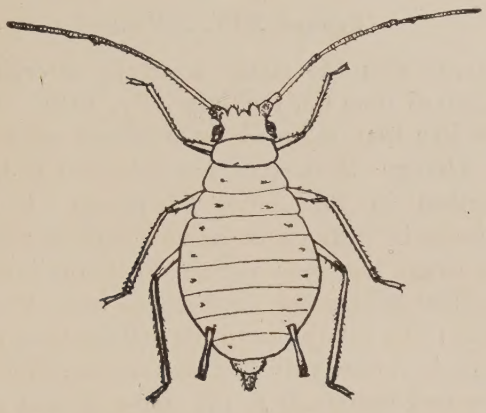

Fig. 1.—Potato Aphid (*Rhopalosiphum solani*), wingless virgin female. Magnified 20 times.

The genus Rhopalosiphum may be recognized by the tubercles on the head at the base of the feelers, which are shorter than the body, and by the swollen cornicles. Most students of aphids have regarded the potato-feeding species as *R. dianthi* (Schranck), an insect with many food-plants. Theobald, however, considers it distinct, and has named it *R. solani*. The wingless virgin female (fig. 1) is green or pink, the tips of the feelers and of the leg-segments being often darker. The winged virgin female has a black head and yellowish thorax and legs, the latter having black tips to the thighs and shins, and green abdomen. The sexual egg-laying insects are as yet unknown. According to Theobald the virgin females—even the winged ones—live quite well underground, so that egg-laying on the tubers is probable.

Blackfly Grubs.

Bibio sp.

The presence of these larvae feeding in potato tubers has been lately recorded in this series of papers (2, pp. 146–7). Another case was noticed in March, 1914, the locality on this occasion being Co. Tyrone.

The Rosy Rustic Moth.

Hydroecia micacea (Esp.).

(Plates XIV, XV a.)

Potato plants with the stalks bored by caterpillars of this moth were received from Co. Louth in July, 1915. This method of feeding is like that followed by a nearly related species—the Frosted Orange Moth (*Gortyna ochracea*) which has been already described in this series of papers (1, pp. 253–4). *Hydroecia micacea* is common in Ireland, and damage to potato stalks by its larvae has been noticed by Pethybridge (7), who gives an excellent photograph (reproduced here, Plate XIV, by kind permission) of a caterpillar in the hollowed-out potato stalk, which furnishes it at once with food and shelter. The caterpillars of this species feed commonly in the stems of dock (*Rumex*) and Horsetails (*Equisetum*). They resemble the caterpillars of *Gortyna ochracea* rather closely, but are darker in colour, with less conspicuous black spots, and the plate on the front body-segment (prothorax) is yellow, with a black front edge. The larval stage lasts from May till July. When fully grown the caterpillar pupates in the soil, close to the roots of its food-plant. The moth is on the wing in August and September, when eggs are laid, which carry the species over the winter. The moth (Plate XV a) has pale rosy-brown forewings, with dark transverse bands and markings. The caterpillars have the habit of going from one plant to another, and they thus cause considerable injury. Unfortunately nothing can be done to destroy them short of pulling up and burning the infested plants.

MANGEL INSECTS.

The Black Carrion Beetle.

Silpha opaca Linn.

On several occasions the damage caused by these beetles and their grubs to the leaves of young mangel plants has been noticed (1, pp. 431–2) in Ulster and elsewhere. A case of similar injury was observed in Westmeath in June, 1915, when the woodlouse-shaped larvae were abundant on a crop.

The Brassy Flea-beetle.

Plectroscelis concinna (Marsh).

Young mangel-plants, on which these little jumping beetles were abundant, came in June, 1915, from Co. Galway. I am indebted for the observation and the specimens to my friend and former pupil, Brother Jarlath Edwards, of the Mount Bellew Agricultural College. The observation is of considerable interest, as the species is new as a mangel-pest, though well known as an enemy to cruciferous crops, being one of the species often included under the comprehensive term "turnip-fly." In the south of England it is also very destructive to hops, on account of which it is called the "hop-flea." It is shortly ovate in shape, about 2 mm. ($\frac{1}{12}$ inch) long, of a bright shining bronze hue, with the legs brown and the under-surface black. The elytra have rows of rather deep punctures, and the hind thighs are thick, as in Phyllotreta and other "turnip-flies." The feeler has eleven segments; the middle and hind shins are toothed, and the head is small (fig. 2).

Fig. 2.—Brassy Flea-Beetle (*Plectroscelis concinna*). Magnified 12 times.

It is, unfortunately, very hard to destroy these small, jumping beetles on the large scale necessary in farm-practice. The various dressings and mechanical appliances recommended for "turnip-fly" may be expected to give some result, and it would be worth while to try the effect of an arsenical spray.

CARROT AND CELERY INSECTS.

Green Leaf Beetle.

Phaedon tumidulus Germ.

(Plate XV B.)

Celery plants were received from Co. Dublin in November, 1914, with the leaves eaten into holes by large numbers of this beetle, which is a common insect in Ireland, feeding especially on Cow Parsnip (*Heracleum Sphondylium*). It is about 3 mm. ($\frac{1}{8}$ inch) long, shortly oval, with very convex upper surface, deep steel-blue or almost black in colour (Plate XV B). The genus Phaedon belongs to the chrysomeline section of the leaf-beetles, whose members are larger and more convex than those of the "turnip-fly" or halticine section, and have not the characteristically thickened hind thighs of the latter. The same line of treatment may be adopted as for "turnip-fly."

The Carrot Fly.

Psila rosae (Fab.).

This very common insect (see 1, pp. 255–7) was found in carrots from Co. Clare in August, 1914, and in celery plants from Co. Sligo in December, 1915. In the latter case the maggots were boring upwards into the stems, and there can be little doubt that Westwood's species *Piophila apii*, founded in 1848, on maggots mining in celery stems, is really identical with *Psila rosae*, as suggested by Reh (8, p. 414).

FLAX INSECTS.

The Flax Flea-beetle.

Longitarsus parvulus Payk.

This insect has already been described and figured (1, pp. 152–3) in this series, under the name *L. ater* (Fab.). In June, 1915, it was particularly abundant and destructive in Ulster. It will be remembered that 1912 was also a noteworthy year for serious damage caused by this beetle (2, p. 83).

TOBACCO INSECTS.

Turnip Moth and Heart-and-Dart Moth.

Agrotis segetum (Schiff.) and *A. exclamationis* (Linn.).

The "surface caterpillars" of the Turnip Moth were noticed four years ago as harmful to tobacco plants (2, pp. 63–4). In October, 1914, they were in the same way injurious in King's County, and, to a less degree, in Cos. Meath, Wexford, and Limerick. Mr. G. N. Keller, of the Department of Agriculture, informed me that the damage was greatest on light soils of a gravelly nature. In one case nine caterpillars were found around a single plant, feeding on the leaves in contact with the ground. Specimens of the *A. exclamationis* larvae came at the same time, and also from King's County. These were not observed until they had been brought into the curing-house, along with the leaves, when "their presence was brought to the grower's notice by some chickens, which proceeded to peck the leaves to pieces."

ORCHARD INSECTS.

Shield Bugs.

Tropicoris rufipes (Linn.) and *Palomena prasina* (Linn.).

While such small members of the Hemiptera as aphids and scale-insects are among the most destructive of plant-pests, the larger members of the order — generally known as "bugs" — though many of them suck sap from plants, are rarely looked upon as injurious. In July, 1915, young apples from Kilkenny were received with the skin covered with minute punctures, and curiously wrinkled. On them were immature specimens (nymphs) of the large common shield-bug *Tropicoris rufipes*. In June, 1915, apple foliage from Co. Galway was received, injured by the piercing and sucking of another common bug, *Palomena prasina*. I have already recorded (2, pp. 64–6) a capsid bug (*Lygus pabulinus*) as harmful to rose-leaves, and a shield-bug (*Acanthosoma haemorrhoidale*) (2, pp. 90–1) to apple-buds, in Ireland. Fryer (4, 5) gives valuable information as to the damage caused by various Capsidae to young apples in England. Reh (8, p. 618) quotes an Italian record of injury caused by *Palomena prasina* to the foliage of various sub-tropical plants.

Both Palomena and Tropicoris belong to the large family of the Shield-bugs (Pentatomidae) distinguished by their five-segmented feelers, and the very large triangular scutellum of the

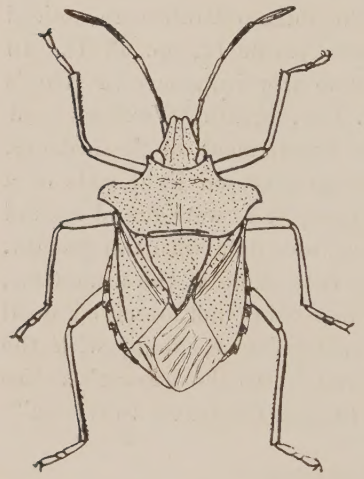

Fig. 3.—Red Shield Bug (*Tropicoris rufipes*).

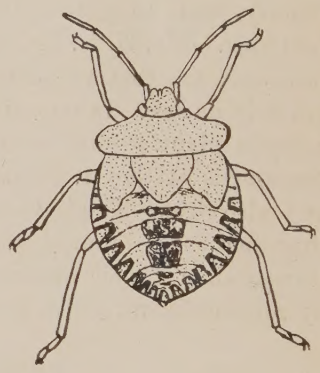

Fig. 4.—Nymph of *Tropicoris rufipes*.

Magnified 2½ times.

mid-thorax. The insects are of a characteristic flattened form. In Tropicoris and Palomena the beak or rostrum beneath the head,

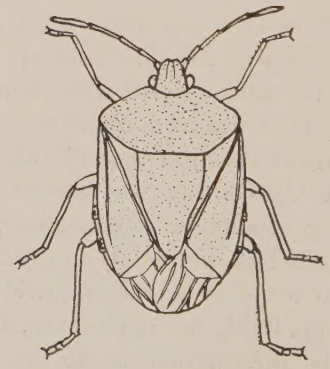

Fig. 5.—Green Shield-Bug (*Palomena prasina*). Magnified 2½ times.

in which the piercing-jaws work to-and-fro, is very elongate and slender, and the foot has three segments. *Palomena prasina* (fig. 5)

is a smooth green insect, about 13 mm. (½ inch) long, with the side-edges and the under-surface reddish. *Tropicoris rufipes* (fig. 3) is usually rather larger, with the hind corners of the pronotum prolonged into conspicuous processes. It is reddish bronzy-brown above, with the under-surface and legs red.

Like other shield-bugs the young of these insects resemble the adults in their general flattened form, and the wing-rudiments appear at an early stage. They are active throughout life, feeding, like their parents, on sap; and in the case of the Tropicoris the young (fig. 4) seem to do more damage than the adults. Of the various washes that have been used for the destruction of bugs on plants, soap and nicotine mixture seems the most effective. Mr. A. G. Dupuis, to whom I owe the specimens of Tropicoris from Kilkenny, tells me that these insects seem to do all the damage in the immature stages; these were found in clusters on the fruits when they were no larger than filberts; the young bugs entirely destroyed the apple-crop on about thirty trees.

The Plum Aphid.

Aphis pruni Réaumur.

Plum shoots from Co. Longford with the leaves curled by the sucking action of this aphid were received in July, 1915. It has already been discussed in this series of papers (1, pp. 437–8). In addition to the varieties of plum, *A. pruni* also attacks damsons.

The Garden Chafer.

Phyllopertha horticola (Linn.).

In June, 1915, some of these common beetles were received from Co. Galway, together with young apples which they were gnawing. This habit of the Garden Chafer was mentioned some years ago (1, p. 263) in this series of papers, and a description with figures of the insect (2, pp. 79–81) has also been given. Similar damage in the south of England is recorded by Theobald (10, pp. 14–15).

The Clay-coloured Weevil.

Otiorrhynchus picipes (Fab.).

A description with figures of this common orchard pest and its relation *O. sulcatus* Fab. was given some years ago (1, pp. 579–

581), and their ravages have been several times recorded since. In May and June, 1914, *O. picipes* was especially abundant in Co. Tyrone, and some interesting particulars as to its habits and means adopted for destroying it were kindly furnished to me by Mr. T. S. Porter. He succeeded in capturing large numbers of the weevils by shaking them off the trees on to calico cloths laid on the ground. At first a tip was enough to dislodge the insects, but afterwards as the foliage developed it was found that the beetles, instead of dropping readily, clung to the leaves, so that some force was necessary in order to dislodge them. "Tanglefoot," now in common use for banding fruit-trees, and effective against delicate insects such as the Winter Moth, does not appear to stop these weevils, as they were able to climb out of a bucket, the inside of which was coated with the sticky substance.

The Eyed Hawk Moth.

Smerinthus ocellatus (Linn.).

Damage to apple foliage from the large caterpillars of this moth has been several times mentioned (1, pp. 578–9, fig. 7, p. 602; 2, p. 152). In August, 1915, it was again noticed—on this occasion in Co. Kerry.

The Apple Leaf-miner.

Lyonetia clerckella (Linn.).

(Plate XVI.)

Leaves from "Bramley's Seedling" apple-trees, mined by the caterpillars of this moth, were received from Co. Louth in November, 1914. The presence of these caterpillars may be known by the long, winding tunnels which they make through the green tissue of the leaves. A good account of this insect has been given by Theobald (11, pp. 96–100), who has kindly allowed me to use his illustrations (Plate XVI). The life-history is somewhat remarkable. The moths live through the winter in sheltered cracks and under rubbish, and the female lays in April, eggs, one on each leaf, into which the little caterpillar bores its way. After about a month the larvae are fully grown; then they come out of their mines and spin silken cocoons (Plate XVI A) on the leaves, the moths appearing in June and July. From the eggs of these are developed

a second brood of caterpillars which feed in July and August, and then complete their transformations, giving rise to a third generation of larvae which feed in September and October; the moths which result from these hibernate as already mentioned. The moth (Plate XVI, iii) has narrow wings which measure about 8 mm. ($\frac{1}{3}$ inch) in expanse. The forewings are brownish-white with a narrow dark median band and dark spots at the tip. The caterpillar is green in colour, and flat in form in correspondence with its leaf-mining habit. On account of the complete protection afforded by the mines to the larvae, nothing but hand-picking and burning the leaves can be recommended for their destruction, though spraying in April with paraffin emulsion might prevent egg-laying.

Blackfly Grubs.

Bibio sp.

These grubs are mentioned and figured in the last of these papers (2, pp. 146–7, Plate XIII A) as destructive to potato tubers. In December, 1914, a large number of them were found in the surface soil beneath apple-trees in a Co. Antrim orchard, apparently feeding on the manure with which the roots had been top-dressed. This observation is of interest, as the flies are often found in spring-time around apple-blossoms.

GARDEN PESTS.

Root Mites and White Springtails.

Rhizoglyphus echinopus Furm. and Rob. and *Isotoma tenella* (Linn.).

(PLATE XVII.)

Tulip bulbs damaged by these two pests—both present in large numbers—were received in May, 1915, from Co. Dublin. The Root Mite has been described and figured (1, pp. 258–260) and several times recorded (1, p. 298, p. 340; 2, pp. 152–3, Plate XIII B) in this series of papers, while the Isotoma was noticed (2, pp. 61–3, fig. 7) as harmful to potato tubers.

The Green Leaf Weevil.

Phyllobius viridiaeris Laich.

In May, 1915, this beetle was observed in numbers in Co. Tipperary eating the leaves of climbing-roses. Some account of its damage to apple-foliage has already been given (2, pp. 91–2).

The Black Vine Weevil.

Otiorrhynchus sulcatus (Fab.).

Ferns injured by this common beetle were received in June, 1915, from Co. Dublin. It is a well-known pest to many kinds of garden plants as well as to fruit trees.

The Winter Moth.

Cheimatobia brumata (Linn.).

Caterpillars of this common moth (see 1, pp. 329–331, Plate XXVIII) were received from Co. Dublin in June, 1915, feeding on Rhododendron leaves. These caterpillars are noted for their omnivorous habits, but I am not aware that this particular food-plant has previously been recorded for them. On this occasion the damage was promptly stopped by spraying with lead arsenate wash.

Swift Moths.

Hepialus sp.

In November, 1914, tulip bulbs eaten out by young caterpillars of some swift moth (see 1, pp. 195–7) were received from County Dublin. This seems a mode of feeding by these insects that is rarely observed.

FOREST INSECTS.

Hazel and Leaf Weevils.

Strophosomus coryli (Fab.) and *Phyllobius argentatus* (Linn.).

(Plate XV c, d.)

In June, 1914, my friend Mr. A. C. Forbes observed *Strophosomus coryli* feeding on larch in Co. Wicklow, and in May, 1915, he found this species, and also *Phyllobius argentatus*, on the same kind of tree in Co. Antrim. These species are well-known leaf-eaters on a great variety of deciduous trees and shrubs, but they appear not to have been hitherto noticed as destructive to any coniferous tree, though Fowler (3, vol. v, p. 189) records fir as a habitat for *S. coryli*. The deciduous foliage of the larch in its fresh young growth during May and June resembles, of course, that of "broad-leaved" trees more than that of evergreen conifers does.

Weevils of the genus Strophosomus may be known by their short, broad, globular body and broadly triangular head with very prominent eyes. The insects are covered with brown or grey scales; in *S. coryli* (Plate XV c) there is at the base of the suture of the wing-sheaths (elytra) a longitudinal patch, bare of scales, which shows up as a conspicuous dark streak. This beetle varies in length from 4·5 to 6 mm. ($\frac{1}{5}$–$\frac{1}{4}$ inch) in length. Species of Phyllobius have been recorded in these papers (2, pp. 39–40, fig. 4, pp. 91–2) as harmful to apple foliage. They are weevils with rather narrow parallel-sided bodies, and short, broad snouts and long feelers. *P. argentatus* (Plate XV d) is clothed with shining green scales mixed with long erect hairs, and has the feelers yellowish red; it is therefore a handsome and conspicuous insect. When weevils like these become injurious to trees, it is advisable, if practicable, to shake them off the branches on to cloths or boards, and to kill them. If the plantation is not too large for spraying to be adopted, an arsenical wash is, of course, appropriate, as the beetles feed by devouring the solid leaf-substance.

PARASITES OF ANIMALS.

The Cattle-Biting Louse.

Trichodectes scalaris Nitzsch.

Specimens of this parasite were found rather plentifully on cattle in Co. Dublin in the autumn of 1914. The insect belongs to the Mallophaga or "biting lice," which do not—as the true lice (Anoplura) do—suck blood, but bite with their mandibles at the hair and surface skin of their hosts. Nevertheless, when numerous, they eat into the skin sufficiently to cause bleeding, so that distinct lesions become visible on the animals as in the case now recorded.

The main structural features of Trichodectes have already been given in this series (1, pp. 421–2) in connexion with *T. sphaerocephalus*, the nearly related species that is found on sheep. *T. scalaris* (fig. 6) is very similar to that species, but differs in the shape of its head, which is heart-shaped rather than rotund, and in its feebler feelers and shorter legs. The insect is

minute, measuring only 1 mm. ($\frac{1}{25}$ inch) in length, and of a shining reddish colour, with dark paired spots in front of the head and the abdominal terga dusky.

Fig. 6.—Cattle-Biting Louse (*Trichodectes scalaris*). Female. Magnified 24 times.

Fig. 7.—Egg of *Trichodectes scalaris.*

In my notes on *T. sphaerocephalus* I laid stress on the importance of two dippings or washings for infected animals at an interval of about ten days. The eggs (fig. 7), which are attached to the host's hairs, have strong envelopes, and are not killed by a poison which kills the insect. After the period named the eggs will have hatched and the young Trichodectes emerged from them will be exposed to the action of the "dip"; thus they will be killed before they become mature and capable of egg-laying. This precaution should be taken in treating cattle for the destruction of *T. scalaris.*

The Bee "Louse."

Braula caeca Nitzsch.

Bees infested with this minute parasitic insect were received during April, 1915, from Co. Louth, and also from Co. Galway, the observers being Mr. J. Harney and Mr. T. B. O'Bryen.

Hitherto it seems to have escaped notice in Ireland, and it may possibly be a recent introduction into the country, as it is believed to be uncommon in northern and western Europe, though of frequent occurrence on bees in Italy.

Braula is not a louse, but a degraded wingless member of the order Diptera, which includes the two-winged flies. It is a very near ally of that well-known parasite of sheep the "Ked" (*Melophagus ovinus*), which it resembles in its strange life-history, the young being born as a full-grown maggot which pupates quickly after birth. Braula differs from Melophagus in its much shorter proboscis and in the total absence of eyes. The

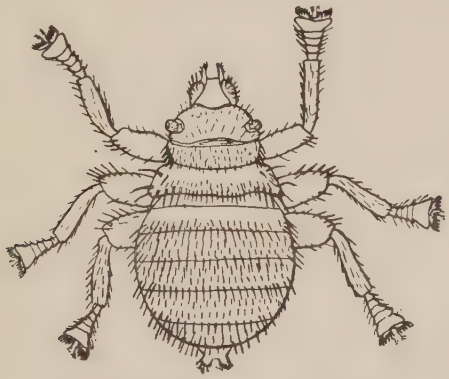

Fig. 8.—Bee Louse (*Braula caeca*). Magnified 24 times.

legs are short, with thick thighs, bent shins and five-segmented feet, the terminal foot-segment being very wide, and bearing a pair of long claws, each with broad spines arranged in a comb-like row.

The Braula pierces the bee's cuticle with its sharp jaws, and sucks juices from the bee's body. There can be no doubt that a bee infested with a number of these parasites must lose condition and become enfeebled. Usually not more than a dozen are found on one bee, but there are instances on record of over seventy on a single host—a serious burden, since the Braula, though a minute insect, is relatively a large parasite in relation to the bee.

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EXPLANATION OF PLATES.

PLATE XIV.

A. Caterpillar of *Hydroecia micacea*, feeding in Potato stem. From Pethybridge, in *Journ. Dept. Agric. Ireland*, vol. xv. (By permission of the Department.)

PLATE XV.

A. Rosy Rustic Moth (*Hydroecia micacea*). Natural size.

B. Green Leaf-beetle (*Phaedon tumidulus*). Magnified three times.

C. Hazel Weevil (*Strophosomus coryli*). Magnified three times.

D. Leaf Weevil (*Phyllobius argentatus*). Magnified three times.

E. Potato Shoot, with Aphids (*Rhopalosiphum solani*) feeding.

Photographs by H. Pattison.

PLATE XVI.

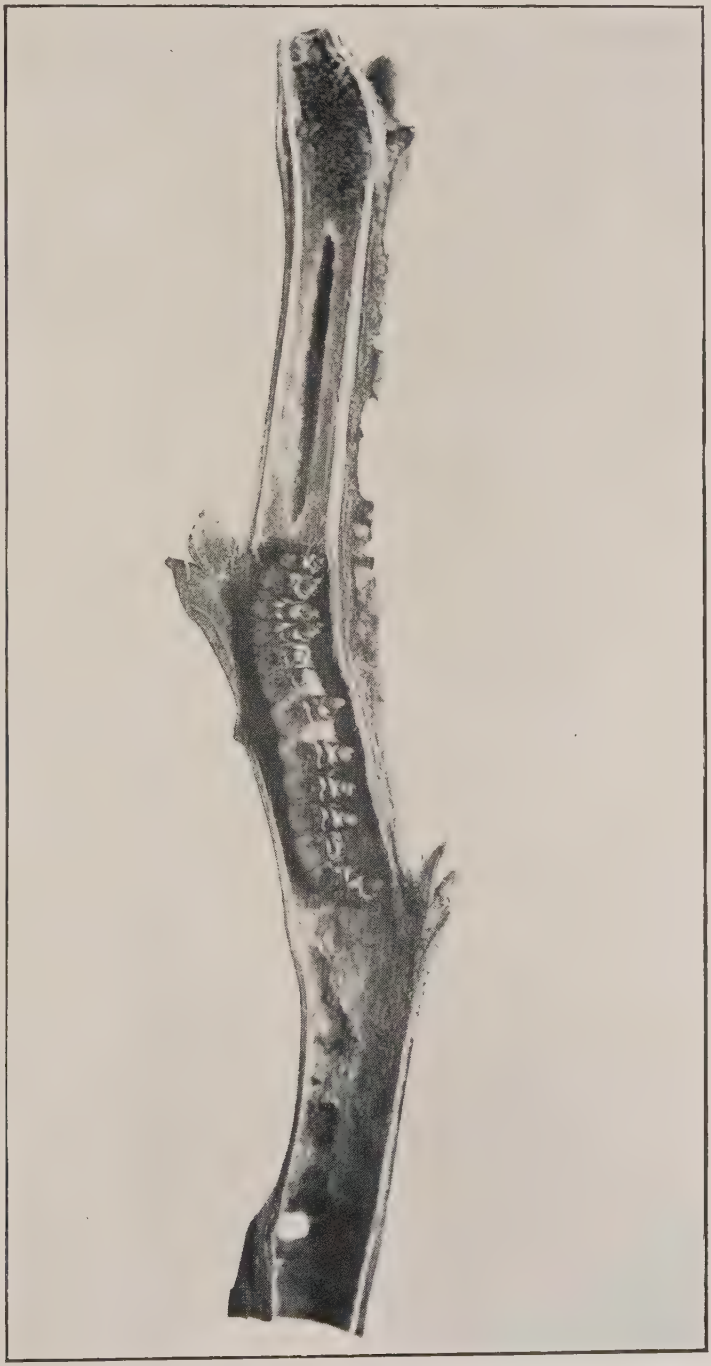
I, II. Apple Leaves injured by Caterpillars of *Lyonetia clerckella*. Cocoon at A. Mined leaf to right.

III. *Lyonetia clerckella*. Magnified seven times.
From Theobald: "Insect Pests of Fruit."

PLATE XVII.

Tulip Bulbs injured by Root-mites (*Rhizoglyphus echinopus*) and White Springtails (*Isotoma tenella*).

Photograph by T. Price.



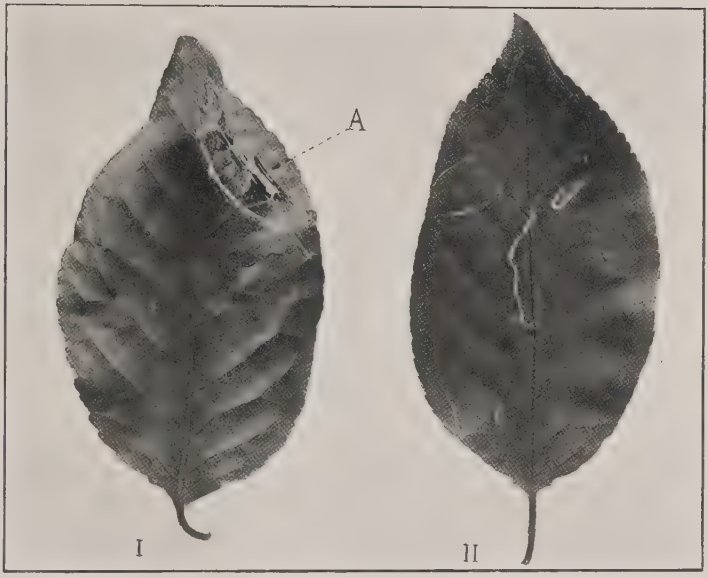
A

B

C

D

E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